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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,242	06/24/2003	Ye Fang	SP02-143	1181
22928 7590 02/18/2010 CORNING INCORPORATED SP-TI-3-1 CORNING, NY 14831				
EXAMINER YANG, NELSON C				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/602,242

Applicant(s)

FANG ET AL.

Examiner

Nelson Yang

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-8, 10-18, 27, 42-50, 52-58, 60-62, 64 and 66 is/are pending in the application.
- 4a) Of the above claim(s) 3, 6-8 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 5, 10-18, 42-50, 52-58, 60-62, 64 and 66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-840)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment of claims 1, 3-8, 10, 12-15, 42, 49, 57, 62, 64 is acknowledged and has been entered.
2. Claims 1, 4, 5, 10-18, 42-62, 64, 66 are currently under examination.
3. Claims 3, 6-8, 27 are withdrawn.
4. Claims 2, 9, 19-26, 28-41, 63, 65 are cancelled.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4-5, 10-18, 42-48, 51-54, 57-62, 64, 66 are rejected under 35 U.S.C. 103(a) as being obvious over Fang et al. [US 2002/0094544] in view of Löfås [US 5,922,594] in light of Hildreth [US 2002/0128227].

With respect to claims 1, 4, 5, Fang et al. teach an array comprising a plurality of probe biological membrane microspots associated with a surface of a substrate in an environment exposed to air under ambient or controlled humidities (para. 0009, 0031), wherein the surface is coated with an amine presenting molecule such as thioalkyl amine (para. 0016-0017). The biological membrane microspots comprise a probe that binds with a target compound (para. 0009, 0031-0033), and further teach detection of a binding event with the membrane bound

protein. Fang et al. further teach detection of a binding event using the probe array after incubation in a humid chamber at room temperature for a hour (para. 0130), which would enable lateral distribution of the lipid molecules. Although Fang et al. do not specify the incubation would be to enable lateral fluidity of the lipids, applicants have not specified any other requirement to enable lateral fluidity of the lipids other than to incubate the array in a humid chamber, this limitation would read on the method of Fang et al. since Fang et al. do teach the step of incubating the array in a humid chamber. Fang et al., however, do not specify monitoring for binding activity of at least one of the biological lipid membranes with toxin in a sample

Löfås, however, teaches liposomes containing ganglioside G_{M1} for detecting cholera toxins in a sample (column 5, 6, example 1), wherein cholera is a bacterial toxin, as evidenced by Hildreth (see para. 0041). Löfås further teaches that this allows for the detection and determination of the specific activity of the lipid bilayer for binding to cholera toxins, thus providing important information of binding of cholera toxin with biological membranes (column 6, lines 1-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used gangliosides such as G_{M1} as probes in the array of Fang et al., as suggested by Löfås et al., in order to be able to detect the presence of cholera toxin in a sample utilizing a system similar to biological membranes, thus allowing for a more accurate assessment of the effects of the cholera toxin on biological membranes.

7. With respect to claims 10, 11, 14, Fang et al. further teach that the analyte may be labeled and detected (para. 0103).

8. With respect to claim 12, Fang et al. teach detecting a physical change in physical properties at the interface due to a binding event between the target and the probe (para. 0033).
9. With respect to claim 13, Fang et al. teach unlabeled target (para. 0033).
10. With respect to claim 15, Fang et al. teach synthetic or natural analytes (para. 0083), as discussed above.
11. With respect to claims 16, 18, Fang et al. teach glass slides (para. 0012).
12. With respect to claim 17, Fang et al. teach porous substrates (para. 0067).
13. With respect to claims 42, Fang et al. teach an array comprising a plurality of biological membrane microspots associated with a surface of a substrate in an environment exposed to air under ambient or controlled humidities (para. 0009), wherein the surface is coated with a amine presenting molecule (para. 0016-0017). The biological membrane microspots comprise probes such as G-protein coupled receptors or G-proteins (para. 0009), which would bind to chemical toxins. Fang et al. further teach detection of a binding event using the probe array after incubation in a humid chamber at room temperature for an hour (para. 0130), which would enable lateral distribution of the lipid molecules. Fang et al., however, do not clearly disclose that the probes may include a bacterial toxin-binding receptor.

Löfås, however, teaches liposomes containing ganglioside G_{M1} for detecting cholera toxins in a sample (column 5, 6, example 1), wherein cholera is a bacterial toxin, as evidenced by Hildreth (see para. 0041). Löfås further teaches that this allows for the detection and determination of the specific activity of the lipid bilayer for binding to cholera toxins, thus providing important information of binding of cholera toxin with biological membranes (column 6, lines 1-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used gangliosides such as G_{M1} as probes in the array of Fang et al., as suggested by Löffås et al., in order to be able to detect the presence of cholera toxin in a sample utilizing a system similar to biological membranes, thus allowing for a more accurate assessment of the effects of the cholera toxin on biological membranes.

14. With respect to claims 43-44, Fang et al. further teach that the analyte may be labeled and detected by fluorescence (para. 0103).

15. With respect to claim 45, Fang et al. teach washing to remove unbound targets (para. 0104).

16. With respect to claim 46, Fang et al. teach that the array of microspots is incubated with labeled cognate target and an unlabeled target compound, and the binding event between the unlabeled target compound and the probe is determined by measuring a decrease in the signal of the label due to competition between the cognate labeled target and the unlabeled target compound for the probe (para. 0033).

17. With respect to claim 47, Fang et al. teach detecting a physical change in physical properties at the interface due to a binding event between the target and the probe (para. 0033), wherein the target is unlabeled (para. 0033).

18. With respect to claim 48, Fang et al. teach measuring a change in refractive index (para. 0033).

19. With respect to claim 51, as discussed above, the amines used by Fang et al. may be γ -aminopropylsilane (para. 0015).

20. With respect to claims 52, as discussed above, the amines used by Fang et al. may be polyethylenimine (para. 0068).
21. With respect to claim 53, Fang et al. teach coating with γ -aminopropylsilane (para. 0015).
22. With respect to claim 54, the amines used by Fang et al. may be polyethylenimine (para. 0068).
23. With respect to claims 57, 62, Fang et al. teach an array comprising a plurality of biological membrane microspots associated with a surface of a substrate in an environment exposed to air under ambient or controlled humidities (para. 0009), wherein the surface is coated with an amine presenting molecule such as thioalkyl amine (para. 0016-0017). The biological membrane microspots comprise probes that bind to specific target analytes (para. 0009, 0031-0033). Fang et al. further teach detection of a binding event using the probe array after incubation in a humid chamber at room temperature for a hour (para. 0130), which would enable lateral distribution of the lipid molecules. Fang et al., however, do not specify monitoring for binding activity of at least one of the biological lipid membranes with toxin in a sample.

Löfås, however, teaches liposomes containing ganglioside G_{M1} for detecting cholera toxins in a sample (column 5, 6, example 1), wherein cholera is a bacterial toxin, as evidenced by Hildreth (see para. 0041). Löfås further teaches that this allows for the detection and determination of the specific activity of the lipid bilayer for binding to cholera toxins, thus providing important information of binding of cholera toxin with biological membranes (column 6, lines 1-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used gangliosides such as G_{M1} as probes in the array of Fang et al., as

suggested by Löffs et al., in order to be able to detect the presence of cholera toxin in a sample utilizing a system similar to biological membranes, thus allowing for a more accurate assessment of the effects of the cholera toxin on biological membranes.

24. With respect to claims 58-61 as discussed above, the amines used by Fang et al. may be γ -aminopropylsilane (para. 0015).

25. With respect to claim 64, Löffs teach the detection of cholera toxin, which is a bacterial toxin, by binding to ganglioside GM₁.

26. With respect to claim 66, Fang et al. teach lipids printed on GAPS substrate (para. 0141), and would therefore have a mobile fraction of about 0.5, based on applicants own admission (see specification, para. 0041).

27. Claims 49-50, 55, 56 are rejected under 35 U.S.C. 103(a) as being obvious over Fang et al. [US 2002/0094544] in view of Löffs [US 5,922,594] and in view of Cass [US 2002/0168692] in light of Hildreth [US 2002/0128227].

With respect to claims 49, Fang et al. teach an array comprising a plurality of biological membrane microspots associated with a surface of a substrate in an environment exposed to air under ambient or controlled humidities (para. 0009), wherein the surface is coated with a amine presenting molecule such as thioalkyl amine (para. 0016-0017). The biological membrane microspots comprise probes that bind to specific target analytes (para. 0009, 0031-0033). Fang et al. further teach detection of a binding event using the probe array after incubation in a humid chamber at room temperature for a hour (para. 0130). Fang et al., however, do not specify monitoring for binding activity of at least one of the biological lipid membranes with an

unknown toxin in a sample by comparing the binding pattern of the unknown toxin with that of a known toxin to identify and detect the presence of the toxin in the sample.

Löfås, however, teaches liposomes containing ganglioside G_{M1} for detecting cholera toxins in a sample (column 5, 6, example 1), wherein cholera is a bacterial toxin, as evidenced by Hildreth (see para. 0041). Löfås further teaches that this allows for the detection and determination of the specific activity of the lipid bilayer for binding to cholera toxins, thus providing important information of binding of cholera toxin with biological membranes (column 6, lines 1-28).

Cass further teaches comparing an array binding pattern with the array binding pattern of known test ligands in order to allow accurate identification of a test compound (para. 0042-0045, 0060).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have compared the binding pattern of an unknown toxin in a sample with that of known toxins, as suggested by Cass et al., in order to allow for accurate identification of a test compound.

28. With respect to claim 50, Fang et al. teach synthetic or natural analytes (para. 0083), as discussed above.

29. With respect to claims 55, as discussed above, the amines used by Fang et al. may be γ -aminopropylsilane (para. 0015).

30. With respect to claims 56, as discussed above, the amines used by Fang et al. may be polyethylencimine (para. 0068).

Double Patenting

31. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 5, 42-48, 53, 54, 57, 62 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 54-70 of copending

Application No. 09/974,415 [published as US 2002/0094544] in view of Löffs [US 5,922,594].

32. Although the conflicting claims are not identical, they are not patentably distinct from each other because the conflicting claims recite a method for detecting a binding event comprising providing a substrate with a plurality of biological membrane microspots comprising aminopropylsilane and proteins for binding and detecting binding using labeled targets and wherein the array is incubated under controlled humidity (claims 54, 55, 79). The copending application, does not specifically teach incubating the array in a composition comprising one or more toxins and monitoring for binding activity of at least one of the biological lipid membranes with toxin in a sample.

Löfås, however, teaches liposomes containing ganglioside G_{M1} for detecting cholera toxins in a sample (column 5, 6, example 1), wherein cholera is a bacterial toxin, as evidenced by Hildreth (see para. 0041). Löfås further teaches that this allows for the detection and determination of the specific activity of the lipid bilayer for binding to cholera toxins, thus providing important information of binding of cholera toxin with biological membranes (column 6, lines 1-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used gangliosides such as G_{M1} as probes in the array of Fang et al., as suggested by Löfås et al., in order to be able to detect the presence of cholera toxin in a sample utilizing a system similar to biological membranes, thus allowing for a more accurate assessment of the effects of the cholera toxin on biological membranes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

33. Applicant's arguments filed October 30, 2009 have been fully considered but they are not persuasive.

34. With respect to applicant's arguments regarding claims 1, 4-5, 10-18, 57-62, 64, 66 that Löfås do not teach the detection of a bacterial toxin or a probe comprising a bacterial toxin binding receptor, the Office notes that Löfås does in fact teach a bacterial toxin and a probe comprising a bacterial toxin binding receptor, more specifically, cholera toxin, and G_{M1}

gangliosides, which is shown by Hildreth [US 2002/0128227] above as being a bacterial toxin and a bacterial toxin-binding receptor.

35. The terminal disclaimer filed October 30, 2009 was not approved because 37 CFR 1.321 (c)(3) requires that a terminal disclaimer "include a provision that any patent granted on that application or any patent subject to the reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the judicially created double patenting."

36. The words "legal title" do not include common ownership as to equitable title. Should this be corrected, however, the double patenting rejection would be withdrawn.

37. For these reasons, the rejections have been maintained.

38. Applicant's amendment of claims 42 and 49 have necessitated new rejections, which have been discussed above.

Conclusion

39. No claims are allowed.

40. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Yang whose telephone number is (571)272-0826. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on (571)272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nelson Yang/
Primary Examiner, Art Unit 1641